

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing

(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION

See paragraph 2 below

International application No.
PCT/JP2005/010906

International filing date (day/month/year)
08.06.2005

Priority date (day/month/year)
08.06.2004

International Patent Classification (IPC) or both national classification and IPC
G02F1/167

Applicant
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1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

10/553769
International application No.
PCT/JP2005/010906

Box No. I Basis of the opinion

JC20 Rec'd PCT/PTO 20 OCT 2009

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/JP2005/010906

**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or
Industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	1-8
	No: Claims	
Inventive step (IS)	Yes: Claims	1-8
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-8
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1. Reference is made to the following documents:

D1: JP 2004-139025 A & US 2005/0094247 A1 (references refer to the US-A cited as translation of the JP-A)

D2: JP 2001-033831 & corresponding PAJ abstract

2. The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, alternative (A), and shows (see Fig. 9 and par. [0125] - [0130]) an electrophoretic display apparatus, comprising a display portion, an electrophoretic dispersion liquid (6), contained in the display portion, comprising charged particles (6a) and a dispersion medium (6b) for dispersing the charged particles, and electrodes (3, 4) for driving the electrophoretic dispersion liquid, wherein the surface of the charged particles is hydrophilic (the particles being titanium dioxide), the dispersion medium (being dodecylbenzene) is hydrophobic, and a surface of an inner wall on which the charged particles are to be deposited (the silicone resin layer 72a) is hydrophobic.
3. The subject-matter of claim 1, alternative (A) therefore differs from this known display apparatus in that the inner wall surface is hydrophilic instead of hydrophobic. The subject-matter of claim 1, alternative (A) is therefore new (Article 33(2) PCT).
4. The device according to D1 addresses the same technical problem as the present application, i.e. balancing image persistence and image erasability in electrophoretic displays (see par. [0007] of D1 and the present description p. 3, l. 25 to p. 4, l. 12), so that the subject-matter of present claim 1 may be considered to provide alternative solutions to this known problem.
5. The device according to D1 further comprises a second, hydrophilic (acrylic resin) layer (71a) between the transparent electrode (3) and the hydrophobic silicone resin layer (72a). However, D1 consistently teaches that the hydrophilic and hydrophobic

layers be arranged "in that order" (par. [0127], [0148]), or that the acrylic and silicone resins be mixed into a single layer (7) (see the other embodiments), so that the skilled person would not be prompted to reverse the order of the layers (71a) and (72a) which would lead to the subject-matter of claim 1, alternative (A), which is therefore considered to be non-obvious (Article 33(3) PCT).

6. The subject-matter of claim 1, alternatives (B)-(D) differs from the device according to D1 at least in that it comprises hydrophobic or hydrophobic and lipophobic particles. Although such particles are known from the prior art (see e.g. D2), their use in an electrophoretic display device in combination with dispersion media and inner wall surfaces as presently claimed is not hinted at by the available prior art, including D1.
7. Claims 2-8 are dependent on claim 1, and as such also meet the requirements of the PCT with respect to novelty and inventive step.
8. The subject-matter of the examined claims, relating to electrophoretic displays, is obviously industrially applicable (Art. 33(4) PCT).

Re Item VII

Certain defects in the international application

The description fails to identify the most relevant prior art (R. 5.1(a)(ii) PCT), and the claims lack reference signs to the drawings (R. 6.2(b) PCT).

Re Item VIII

Certain observations on the international application

Claims 1-5 lack clarity (Art. 6 PCT). They use the expressions "hydrophilic", "hydrophobic", "lipophobic", and "hydrophobic and lipophobic" for defining their subject-matter. However, according to the description, said expressions are not to be understood in the broad sense generally used in the art, but have particular and partially inconsistent meanings that cannot be understood without reference to the description. This is objectionable, see PCT ISPE Guidelines 5.31. Specifically:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

JC20 Rec'd PCT/PTO

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International application No.

20 OCT 2005

PCT/JP2005/010906

1. The term "hydrophobic" normally also includes hydrophobic and lipophobic substances. The present application, however, uses the term "hydrophobic" in the sense "hydrophobic but not lipophobic", which is not commonly understood in the art (see desc. p. 9, l. 23 to p. 10, l. 13). This non-standard terminology renders claims 1-5 unclear.
2. Moreover, according to the description, fluorine-containing compounds are meant to be "hydrophobic and lipophobic", even if they do not meet the limitations for the miscibility or contact angles mentioned on p. 27, l. 2-17 of the description for hydrophobic or lipophobic substances (see p. 28, l. 16 to p. 29, l. 10).
3. Relating to case (C) of claim 1, it is not clear what is meant by "the dispersion medium has a lower hydrophobicity than the inner wall surface". There appears to be no generally accepted method of measuring and comparing the "hydrophobicity" of a liquid with that of a solid, and the description does not provide any clear teachings on this point.